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Application Number		VAV
Filing Date		06000
First Named Inventor	March 4, 1997	DEC 0 6 2002
Art Unit	Tomer Shalit	Dloay Cont
Examiner Name	Tomer Shalit 2674	or ocitier 26h
Attorney Docket Number	Dinh, Düc Q.	
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		Document Number	U.S. PATENT DO	CUMENTS	
Examiner	Cite No.1	Number Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Wher
- 	AA	3,220,121	44/20	The state of Cited Document	THE VAINT PASSAGES OF Dolors
 -	AB	3,517,446	11/30/1965	Cutler	Figures Appear
	AC	3,903,614	6/30/1970	Corlyon et al.	
 -	AD	4,236,325	9/9/1975	Diamond et al	
 -	AE	4,513,235	10/2/1980	Hall et al.	
4	AF	4,599,070	4/23/1985	Acklam et al.	
	AG	4,708,656	7/8/1986	Hladky et al.	
	AH	4,713,007	11/24/1987	De Vries et al.	
	IA.	4,891,764	12/15/1987	Alban	
	AJ	5,019,761	1/2/1990	McIntosh	
1	AK	5,022,407	5/28/1991	Kraft	
	AL	5,240,417	6/11/1991	Horch et al.	
-	AM	5,271,290	8/31/1993	Smithson et al.	
	AN	5,275,174	12/21/1993	Fischer	
	AO		1/4/1994	Cook	
\perp \perp	AP	5,785,630	7/28/1998	Bobick et al.	
\perp	AQ	3,157,853	11/17/1964	Hirsch	
	AR	3,497,668	2/24/1970	Hirsch	
	AS	3,902,687	6/25/1973	Hightower	
	AT	4,160,508	7/10/1979	Salsbury	
	AU	4,581,491	4/8/1986	Boothroyd	
	AV	4,930,770	6/5/1990		
1	AW	4,934,694	6/19/1990	Baker	
1-1-	AX	5,035,242	7/30/1991	McIntosh	
	AY	5,038,089	8/6/1991	Franklin	·
	AZ	5,078,152	1/7/1992	Szakaly	
 	BA	5,299,810	4/5/1994	Bond	
 	3B	5,309,140	5/3/1994	Pierce Pierce	
	C C	5,334,027	8/2/1994	Everett	
	3D	5,547,382	8/20/1996	Wherlock	
	E	5,212,473	5/18/1993	Yamasaki	
	F -	5,466,213	11/14/1995	Louis	
В		5,766,016	6/16/1998	Hogan	
В		5,186,695	2/16/1993	Sinclair	
10		6,422,941	7/23/2002	Mangseth et al.	
<u> </u>	L	6,111,577	8/29/2000	Thorner et al.	20

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Office that issued the document, by the two-letter code (WIPO Standard ST.3). For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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Application Number	09/125,711 UEC	FL
Filing Date	March 4, 1999 March	6 2002
First Named Inventor	Tomer Shalit	40
Art Unit	2674	Center
Examiner Name	Dinh, Duc Q.	
Attorney Docket Number	IMM094	

	miner tials*	Cite No.1	Fore	eign Patent Document Number ⁴ Kind Code ¹ (# known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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$\perp \nu$	N)	BI	EP	EP0349086	1/3/1990	Visser	

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	Complete if Known
Application Number	09/125,711
Filing Date	March 4, 1999
First Named Inventor	Tomer Shalit
Art Unit	2674
Examiner Name	Dinh, Duc Q.
Attorney Docket Number	IMM094

	7.	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
DA	₿J	BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," Proceedings, pp. 247-254, November 6-8, 1990.	
	вк	IWATA, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp 287-292, 1993.	
	BL	RUSSO, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives 08/14/1990, pp. 1-131, May 1990.	
	ВМ	BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.	
	BN	JONES et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.	
	во	BURDEA et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.	
	₿₽	SNOW et al., " Model-X Force-Reflecting-Hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.	
	BQ	OUH-YOUNG, " Force Display in Molecular Docking," Order No. 9034744, p. 1-369, 1990.	
	BR	TADROS, " Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive @ Massachusetts Institute of Technology, pp. 1-88, February 1990.	
	BS	CALDWELL et al., " Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.	
	ВТ	ADELSTEIN, " Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, Advances in Robotics, Edited by H. Kazerooni, pp. 1-12, 1992.	
	BU	GOTOW et al., " Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337	
	BV	STANLEY et al., " Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.	_
M)	BW	RUSSO, " Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Application Number 09/125,711 **Filing Date** March 4, 1999 **First Named Inventor** Tomer Shalit 2674 Art Unit **Examiner Name** Dinh, Duc Q.

IMM094

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		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS	
Examiner	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
DV	вх	KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemanipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.	
	BY	PATRICK et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.	
	BZ	ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.	
	CA	BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.	
	СВ	BEJCZY, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings Of Fourth CISM-IFToMM, Sep. 8-12, 1981.	
	СС	MCAFFEE, "Teleoperator Subsystem/Telerobot Demonsdtrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1-50, A1-A36, B1-B5, C1-C36, January 1988.	
	CD	MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.	
	ÇE	JACOBSEN et al., "High Performance, Dextrous Telerobotic Manipulator With Force Reflection," Intervention/ROV '91 Conference & Exposition, Hollywood, Florida, May 21-23, 1991.	
	CF	SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Expploration, Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.	
	CG	IBM Technical Disclosure Bullein, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.	
	СН	TERRY et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fouteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.	
	CI	HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.	
	СЛ	EBERHARDT et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.	
DN)	ск	RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, Ocotober 1987.	

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Sheet 5 of 6

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Application Number	09/125,711	ILUEIVER
Filing Date	March 4, 1999	DEC OF 2000
First Named Inventor	Tomer Shalit	06 2002
Art Unit	2674 Tec	hnology
Examiner Name	Dinh, Duc Q.	hnology Cemer 2600

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		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS
Examiner Initials *	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
$\mathcal{V}()$	CL	BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.
	СМ	BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.
	CN	OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.
	со	MARCUS, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.
D()	СР	BEJCZY, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.
		

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Application Number 09/125,711

Filing Date March 4, 1999

First Named Inventor Tomer Shalit

Art Unit 2674

Examiner Name Dinh, Duc Q.

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Sheet 6 of 6

Attorney Docket Number IMM094

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Examiner	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
DI)	CQ	AUKSTAKALNIS et at., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.
]	CR	EBERHARDT et al., "Including Dynamic Haptic Perception by The Hand: System Description and Some Results," DSC-Vol. 55-1, Dynamic Systems and Control: Volume 1, ASME 1994.
	CS	GOBEL et al., "Tactile Feedback Applied to Computer Mice," International Journal of Human-Computer Interaction, Vol. 7, No. 1, pp. 1-24, 1995.
	СТ	PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 nd Edition, McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.
	CU	"Cyberman Technical Specification," Logitech Cyberman SWIFT Supplement, 4/5/1994.
	CV	OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95, Seoul, Korea, 21-24 August 1995.
DD	CW	KACZMAREK et al., "Tactile Displays," Virtual Environment Technologies.
		
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	Group Art Unit	2674						
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	Attorney Docket Number	IMM094 (51851-280461)						

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